(5) Add together the products under paragraph (c)(4) of this section and multiply the sum by one-third of the interval between the points at which the breadths are taken. The product is the square foot area of the space at mid-height.

(6) Multiply the area of the space at mid-height by the average of the heights taken each point of division of the space. The product divided by 100 is the tonnage of that space.

(7) The between-deck tonnage is the sum of the tonnage of each level within the between-deck space.

[CGD 87–015b, 54 FR 37657, Sept. 12, 1989, as amended by CGD 97–057, 62 FR 51045, Sept. 30, 1997]

§ 69.113 Superstructure tonnage.

(a) *Defined.* ''Superstructure tonnage'' means the tonnage of all permanent structures, such as forecastle, bridge, poop, deckhouse, and break, on or above the line of the uppermost complete deck (or line of shelter deck, if applicable).

(b) *Method of calculating tonnage.* The tonnage of all structures on each level on or above the uppermost complete deck (or shelter deck, if applicable) is calculated separately as follows:

(1) The length of each structure is measured along its centerline at mid-height between the line of the inboard face of the framing on one end to the line of the inboard face of the framing on the other end. (See § 69.123, figure 11.)

(2) Divide the length under paragaph (b)(1) of this section into an even number of equal parts most nearly equal to those into which the tonnage length is divided under § 69.109.

(3) Measure at mid-height the inside breadth at each end and at each point of division of the length. Number the breadths successively ''1'', ''2'', and so forth, beginning at the extreme forward end of the structure. If an end of the structure is in the form of a continuous arc or curve, the breadth at that end is one-half the nearest breadth. If an end is in the form of an arc or curve having a decided flat, the breadth at the end is two-thirds of the nearest breadth.

(4) Multiply the even numbered breadths by four and the odd numbered by two, except the first and last breadth, which are multiplied by one.

(5) Add together the products under paragraph (b)(4) of this section and multiply the sum by one-third of the interval between the points at which the breadths are taken. The product is the square foot area of the structure at mid-height.

(6) Multiply this area by the average of the heights taken at each point of division of the structure between its decks or the line of its decks. The product divided by 100 is the tonnage of that structure.

(c) A structure having steps in its deck or side must be measured in parts.

(d) The superstructure tonnage is the sum of tonnages of each level above the line of the uppermost complete deck (or shelter deck, if applicable).

(e) When a structure is located over a cut-away portion of the tonnage deck, the structure's height is measured from the under side of its overhead deck to the line of the tonnage deck. If the tonnage deck has no camber, allow for camber in the overhead deck.

(f) For structures of a standard geometric shape, a simple geometric formula that yields an accurate volume may be used.

§ 69.115 Excess hatchway tonnage.

(a) Hatchways that are above the tonnage deck and are either open to the weather or within open structures are measured to determine excess hatchway tonnage. Hatchways that are in between-deck spaces, on decks within closed-in structures, or on open structures are not measured.

(b) The tonnage of a hatchway is its length times breadth times mean depth divided by 100. Mean depth is measured from the under side of the hatch cover to the top of the deck beam.

(c) From the sum of the tonnage of the hatchways under this section, subtract one-half of one percent of the vessel's gross tonnage exclusive of the hatchway tonnage. The remainder is added as excess hatchway tonnage in calculating gross tonnage.